LETTERS TO THE EDITOR

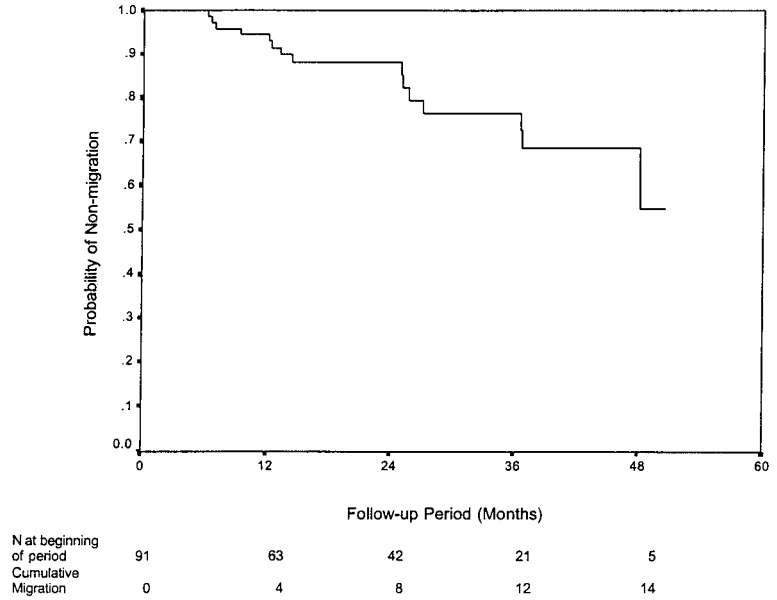
Reply

It is with pleasure that I respond to Dr Arko's letter regarding our recent publication on endograft migration.[1] As per his request, a Kaplan-Meier analysis for freedom from migration is presented in the figure. Risk of endograft migration was approximately 23%, 32%, and 45% at 30, 36, and 48 months, respectively, similar to our previously published data of 20.4% and 42.1% at 24 and 36 months, respectively. As explicitly stated in the original manuscript, the 48-month estimates must be considered preliminary because of the small number of patients at this time point. No patients were "counted twice"[2] in the calculation of migration rates (Figure).

The inference that migration occurred primarily because of "low" initial placement of the endograft[2] is not supported by the data. Migrators and nonmigrators in our study had similar aortic neck/endograft overlap (18.6 mm vs 19.4 mm) and initial distance from the lowest renal artery (7.3 mm vs 7.6 mm, respectively, $P = .8$).[1] If this hypothesis had merit, those patients who migrated should have demonstrated a shorter overlap. Moreover, the initial aortic neck/endograft overlap was substantially longer than the minimum aortic neck length required in the multicenter trial (10 mm) or currently suggested by Medtronic (15 mm). To my knowledge, there have been no other prospectively collected data published on accuracy of proximal endograft placement, and I would invite other investigators to examine and report their results.

Placement of the endograft immediately below the most caudal renal artery is clearly ideal but in practice may not always occur. The Stanford group's "better technique"[2] to attain this goal still resulted in a 20% (16/79) need for immediate aortic cuff placement during endograft insertion for presumed initial malplacement or intraoperative distal migration.[3] At Ochsner, our need for such acute adjunctive measures has been only 3% (4/129). However, current accuracy of endograft placement is likely better than was reported in the early experience with this technology.

The most important finding of our study may have been that aortic neck dilation was highly correlated with endograft migration. While initial aortic neck diameters were similar (21.5 mm $\pm$ 0.6 mm vs 21.8 mm $\pm$ 0.3 mm, $P = .6$), migrators had significant late aortic neck dilation that was not seen in nonmigrators ($P < .05$). Other investigators have also noted a correlation of late aortic neck dilation with endograft migration.[4] As warned by Dr Szilagyi[5] and borne out at late open conversions of this device, there is little healing or incorporation of the proximal end of endografts with



Kaplan-Meier plot of nonmigration.

the aorta. As such, an endograft largely relying on an infrarenal friction seal will have a high risk of distal migration if the aortic neck dilates. This anatomic reality, more than anything else, is the best explanation for the migration rate seen with the AneuRx device. The potential fixation instability of this device has been echoed in two recent editorials written by investigators with substantial endograft experience.[6,7]

These data-driven observations from our study and others force me to disagree with Dr Arko that "migration is preventable. . ."[2] with the AneuRx device. While prudent patient selection and procedural placement accuracy are indeed essential in optimizing results, the risk of migration is unlikely to be prevented unless there is no late aortic neck dilation. Regrettably, progressive aortic neck dilation does occur in some patients after endovascular or open AAA repair.[1,8,9]

The inference that our experience with migration is a single-center aberration is at odds with reports from other experienced investigators who have also observed a significant rate of endograft migration with this device.[4,7,10,11] Most recently, Dr Zarins reported migration rates of approximately 19% at 36 months and 25% to 30% at 40 months (Kaplan-Meier analysis) from 1119 patients in the AneuRx multicenter trial.[12] These migration rates are similar to our single center experience.

Our reported migration *treatment* incidence of 5.4% (5/91) underscores that the true migration rate, as reported in our study, is higher than the number of *treated* patients at any given time point. Since submission of our manuscript, treatment of an additional seven patients for AneuRx device migration has been required (12 total, 13.2%). To date, 10 have been treated with aortic cuffs, 1 with aorto-uni-iliac endovascular conversion, and 1 with open conversion.

As detailed by Dr Robert Rutherford, the true incidence of adverse events relating to endovascular treatment of AAA can be difficult to judge; access to industry-sponsored trial data has been frequently restricted to selected investigators and not published.[14,15] These realities prompted a substantial overhaul in the author responsibilities for publishing such industry-sponsored work in the *Journal of Vascular Surgery*[16] and other leading journals. Differing interpretation of data is an integral and healthy part of the scientific process, but the data must be widely disseminated for such discourse to occur. As clinical investigators with early access to devices, we have a responsibility to other treating physicians and their patients to candidly report late failure modes. We may recognize such events long before they are widely evident. Supplied with such data, practitioners can then decide what are the best treatment options for their patients.

W. Charles Sternbergh III, MD

Program Director, Vascular Surgery
Ochsner Clinic Foundation
New Orleans, La

REFERENCES

1. Conners MS III, Sternbergh WC III, Carter G, Tonnessen BH, Yoselevitz M, Money SR. Endograft migration one to four years after endovascular abdominal aortic aneurysm repair with the AneuRx device: a cautionary note. J Vasc Surg 2002;36:476-84.
2. Arko FR. Regarding "Endograft migration one to four years after endovascular abdominal aortic aneurysm repair with the AneuRx device: a cautionary note." J Vasc Surg 2003;37.
3. Hill BB, Wolf YG, Lee WA, Arko FR, Olcott C, Schubart PJ, et al. Open versus endovascular AAA repair in patients who are morphological candidates for endovascular treatment. J Endovasc Ther 2002;9:255-61.
4. Cao P, Verzini F, Zannetti S, De Rango P, Parlani G, Lupattelli L, et al. Device migration after endoluminal AAA repair: analysis of 113 cases with minimum follow-up of 2 years. J Vasc Surg 2002;35:229-35.
5. Szilagyi DE. The problem of healing of endovascular stent grafts in the repair of AAA. J Vasc Surg 2001;33:1283-5.
6. Chuter TAM. Endovascular aneurysm repair with the AneuRx stent-graft is safe, but is it effective? J Am Coll Cardiol 2001;38:1047-8.
7. Greenberg R. The AneuRx Stent-graft: technical success versus long-term expectations in complex anatomy. J Endovasc Surg 2002;9:470-3.
8. Sonesson B, Resch T, Lanne T, Ivancev K. The fate of the infrarenal neck after open aneurysm surgery. J Vasc Surg 1998;28:889-94.

9. Badran MF, Gould DA, Raza I, McWilliams RG, Brown O, Harris PL, et al. Aneurysm neck diameter after endovascular repair of andominal aortic aneurysms. J Vasc Interv Radiol 2002;13:887-92.
10. Parra J, Ayerdi J, McLafferty RB, Gruneiro L, Ramsey D, Solis M, et al. Conformational changes associated with proximal seal zone failure in abdominal aortic endografts. J Vasc Surg 2003;37:106-11.
11. Ebaugh J, Eskandari M, Finkelstein A, Matsumura J, Morasch M, Hoff F, et al. Caudal migration of endoprosthesis after treatment of abdominal aortic aneurysms. J Surg Res 2002;107:14.
12. Zarins CK, Bloch DA, Crabtree MS, Matsumoto AH, White RA, Fogarty TJ. Migration following endovascular aneurysm repair: importance of proximal fixation. Proceedings of the Southern Association for Vascular Surgery; 2003 Jan; Tucson, Ariz.
13. Rutherford RB. Problem with the dissemination of up-to-date information on the results of endograft repair for AAA. J Vasc Surg 1999;29: 1167-9.
14. Rutherford RB, Johnston KW. Potential problems with industry-supported clinical research. J Vasc Surg 2000;31:1066-76.
15. Scientific data from clinical trials: investigator responsibilities and rights. J Vasc Surg 2002;35:1303-4.

doi:10.1067/mva.2003.196